^{191}Os β^- decay (15.4 d) 1969Ma07,2005Ni12

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	V. R. Vanin et al.	NDS 108, 2393 (2007)	1-Dec-2006

Parent: ^{191}Os: E=0; J$^\pi$=9/2$^-$; T$_{1/2}$=15.4 d *1*; Q(β^-)=312.7 *11*; %β^- decay=100.0

1969Ma07: ^{190}Os(n,γ);Ge(Li); double focusing magnetic spec; ce-ce delayed coin.

2005Ni12: ^{190}Os(n,γ); accurately calibrated HPGe (2002Ha61).

I(L$_\beta$ x ray)=0.394 *35*, I(L$_\alpha$ x ray)=0.281 *34*, I(L$_\gamma$ x ray)=0.091 *11*, I(L$_1$ x ray)=0.011 *10*, Ge(Li) (1989BeYR).

Measured I(L$_1$ x ray)/I(K x ray)=0.0312 *19*, I(L$_1$ x ray)/I(129γ)=0.0608 *41*, Si(Li), germanium detector. Deduced L1 atomic fluorescence yield ω(L1)=0.152 *14* (1993Ma52).

^{191}Ir Levels

E(level)[&]	J$^\pi$[†]	T$_{1/2}$	Comments
0.0[‡]	3/2$^+$	stable	
82.423[#] *10*	1/2$^+$		From ce(L)(47.0):ce(L)(82.4) exp=96 *20*:32 *3* (1969Ma07 with uncertainty in ce(L)(47.0) including 20% for E(ce) energy range, see comment on Iγ), it is deduced 0.09 *7* % β^- feeding for this level.
129.432[‡] *5*	5/2$^+$	122 ps *6*	T$_{1/2}$: coincidence peak centroid shift method, weighted average of: 126 *11* (1969Ma07), 125 *12*(1966Ra01), 80 *16* (1962Be46) ce-β; 131 *10* (1962Li12) ce-ce in ^{191}Pt ε decay. Not included in adopted value 89.9 ps *9*, method subject to discriminator walk.
171.278[@] *23*	11/2$^-$	4.899 s *23*	T$_{1/2}$: from ^{191}Ir IT$_{1/2}$ decay.

[†] From Adopted Levels.
[‡] Band(A): 3/2[402].
[#] Band(B): 1/2[400] (possibly mixed with K-2 γ-vibration coupled to 3/2[402]).
[@] Band(C): 11/2[505].
[&] From a least-squares fit to γ-ray energies.

β^- radiations

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
143 *3*	171.278	100	5.325 *11*	av Eβ=37.5 *3* E(decay): from 1958Na15. Other values: 142 keV *3* (1948Sa18); 143 keV *2* (1951Ko17); 135 keV *5* (1958Jo22); 125 keV *3* (1960Fe03); 147 keV *3* (1963Pl01).

[†] Absolute intensity per 100 decays.

γ(^{191}Ir)

Iγ normalization: Iγ given in photons per decay.

Others: 1948Ka08, 1948Sa18, 1950Ch11, 1950Bu51, 1951Ko17, 1952Jo23, 1952Sw57, 1953Hi03, 1954Bu02, 1954Mc10, 1954Na34, 1955Mi04, 1956Ca50, 1958Na15, 1958Du76, 1958Jo22, 1958Cl42, 1960Fe03, 1964De06, 1967Ag07, 1970Mi15.

Angular correlation measurements: ce $\gamma(\theta)$ (1964De06), X$\gamma(\theta)$ (1971Ge14).

Mult(41.85γ): from ce(L1):ce(L2):ce(L3):ce(M1):ce(M2):ce(M3):ce(M4):ce(M5) exp=3.86 *39*:214 *5*: 216.8 *17*:1.3 *8*:59.7 *7*:62.4 *12*:3.37 *15*:5.81 *41* (1971Pl05). Other values: ce(L1):ce(L2):ce(L3) exp=25:100:108, ce(L)/ce(M) exp=3.5 *3*, ce(M1):ce(M2):ce(M3):ce(M4):ce(M5) exp=2:100:100:6:12 (1966Ma50); ce(L1):ce(L2):ce(L3):ce(M) exp=1.1 *2*:100 *5*:108 *5*:60 *5* (1969Ma07); ce(L1)/ce(L3) exp=0.0183 *13*, ce(L2)/ce(L3) exp=0.987 *16*, ce(M1)/ce(M3) exp=0.0178 *15*, ce(M2)/ce(M3) exp=0.971 *23*, ce(M4)/ce(M3) exp=0.0649 *38*, ce(M5)/ce(M3) exp=0.0937 *51*, ce(N3)/ce(M3) exp=0.240 *13*, ce(N1)+ce(N2)/ce(N3) exp=1.08 *7*, ce(N4)/ce(N5) exp=0.175 *12*, ce(O)+ce(p)/ce(N3) exp=0.367 *18* (1972Br02); α(exp)=(1.35+2.11-0.52)E4 (1965La05).

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γ(^{191}Ir) (continued)

α(exp)=13709 *1900*; α(L)exp=11700 *2100* (1986Bh02).

All δ from Ice data were recalculated by the evaluator using adopted theoretical α (2002Ba85).

δ(82.427γ): the adopted value was calculated by evaluator from conversion electron measurements and sign from Mossbauer ON in ^{191}Pt ε decay. In ^{191}Os β^- decay: δ=0.88 *7* from Ce(L1):Ce(L2):Ce(L3) exp=67 *10*:150 *20*:120 *15* (1969Ma07). Other ce data: Ce(L1):Ce(L2):Ce(L3) exp=1.6:3:2 (1963Pl01); Ce(L2)/Ce(L3) exp=2.2 (1967Pl01).

δ(129.431γ): the adopted value combines different types of measurements, see Adopted Levels, gammas. In ^{191}Os β^- decay, the following measurements gave precise results: δ=0.396 *4* from ce(L1):ce(L2):ce(L3) exp= 100:30.0 *8*:16.6 *3* (given as 100:0.300 *8*:0.166 *3* by the authors, probably a misquote) (1972Br02); δ=0.404 *12* from Ce(L1)+Ce(L2):Ce(L3) exp=7.55 *35* (1964De06). Other: δ=0.386 *22* from ce(L1):ce(L2):ce(L3) exp=36 *4*:9 *1*:5.5 *6* (1969Ma07). Other subshell ratios: ce(K):ce(L1):ce(L2):ce(L3) exp=1000:139:42:24 (1967Pl01); ce(K):ce(L) exp=4.4 *2*, ce(L1):ce(L2):ce(L3) exp= 640:167:^{100,}CeL)/ce(M) exp=4.7 *4*, ce(M1):ce(M2):ce(M3):ce(M4):ce(M5) exp=46:12:10: <1: <1 (1966Ma50); ce(K):ce(L1)+ce(L2):ce(L3):ce(M):ce(N)+ce(O) exp=100:25:3.5:6.1:2.4 (1963Pl01).

E_γ	I_γ[†‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult.	δ	α[#]	Comments
41.846 *22*	0.005885 *8*	171.278	11/2$^-$	129.432	5/2$^+$	E3		1.699×10^4	α(L)=1.220×10^4 *18*; α(M)=3.73×10^3 *6*; α(N+..)=1062 *16* α(N)=925 *14*; α(O)=136.5 *20*; α(P)=0.1454 *21* I_γ: from Ti(41.8)=100 and adopted α. E_γ: weighted average of 41.85 keV *1* (1966Ma50), s; 41.85 keV *3* (1971Pl05), s; 41.76 keV *2* (1967Pl01), s; 41.83 keV *3* (1963Pl01), s; 41.92 keV *2* (1969Ma07), s. Mult.: from subshell ratios, see values under the heading.
47.05 *3*	0.0025 *3*	129.432	5/2$^+$	82.423	1/2$^+$	E2		143.5	α(L)=108.1 *16*; α(M)=27.7 *4*; α(N+..)=7.69 *11* α(N)=6.67 *10*; α(O)=1.010 *15*; α(P)=0.000955 *14* I_γ: from ce(L)(47.0):ce(K)(129.4)exp= 0.96 *7*:206 *15* (1969Ma07) and corresponding theoretical values for adopted multipolarities. Other: Iγ(47.0)/Iγ(129.4)<0.0015 (1969Ma07)Ge(Li). Mult.: from ce(L1):ce(L2):ce(L3) exp=3 *2*:48 *5*:45 *5* (1969Ma07). E_γ: from 1969Ma07, Ge(Li), s. Other value: 46.90 keV *6* (1967Pl01), s.

Continued on next page (footnotes at end of table)

^{191}Os β^- decay (15.4 d) 1969Ma07,2005Ni12 (continued)

$\gamma(^{191}$Ir) (continued)

E_γ	I_γ[†‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult.	δ	α[#]	Comments
82.427 *10*	0.031 *3*	82.423	$1/2^+$	0.0	$3/2^+$	M1+E2	−0.873 *20*	10.53	α(K)=5.32 *12*; α(L)=3.94 *9*; α(M)=0.993 *23*; α(N+..)=0.279 *7* α(N)=0.241 *6*; α(O)=0.0377 *8*; α(P)=0.000687 *15* I_γ: using Ti(82.4)=Ti(47.0) from decay scheme, adopted α, and Iγ(47.0). Other: Iγ(92.4)/Iγ(129.0)=0.0010 *5* (1969Ma07),Ge(Li). E_γ: from 1970Ra37, cryst. Other values: 82.46 keV *4* (1969Ma07), s; 82.52 keV *3* (1966Ma50), s; 82.5 keV *3* (1963Pl01), s, scin Xγ. Mult.,δ: adopted value, from ^{191}Pt ε decay.
129.431 *5*	26.50 *4*	129.432	$5/2^+$	0.0	$3/2^+$	M1+E2	−0.398 *3*	2.75	α(K)=2.15 *3*; α(L)=0.463 *7*; α(M)=0.1098 *16*; α(N+..)=0.0317 *5* α(N)=0.0269 *4*; α(O)=0.00458 *7*; α(P)=0.000265 *4* I_γ: from Ti(129.4)+Ti(47.0)=100, adopted Iγ(47.0), and adopted α. δ,Mult.: adopted value; see comment under the heading for explanation and data from ^{191}Os β^- decay. Other value: δ=−0.28 *6* (1964Ca11) $\gamma\gamma(\theta$,H,t). Other: 1981Gi11. E_γ: from 1970Ra37, cryst. α: α(K)exp=2.134(14) (2005Ni12) from $\alpha(K)\omega(K)$ = 2.044 *11*, ratio between K x ray and γ with a specially calibrated HPGe detector, and using ω(K) = 0.958 *4* (1996Sc06). Other: α(K)exp=1.94 *10* (1963Pl01); α(K)exp=2.32 *6* (1965La05). See 1979Gi01, 1981Gi11, 1984El03, and 1984Sa13 for measurements of linear and circular polarizations, respectively, of this γ in an external magnetic field.

[†] From selected Ice of 1969Ma07 and adopted α, assuming no β^- feeding to g.s. and radioactive equilibrium with ^{191}Ir(4.9 s). Comparison of Ice for E(ce) differing more than 20 keV have an additional 20% of relative uncertainty due to differences in absorption (1969Ma07), and were avoided; other details given under comments for each transition. The very precise Iγ values result from decay scheme characteristics.

[‡] Absolute intensity per 100 decays.

[#] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

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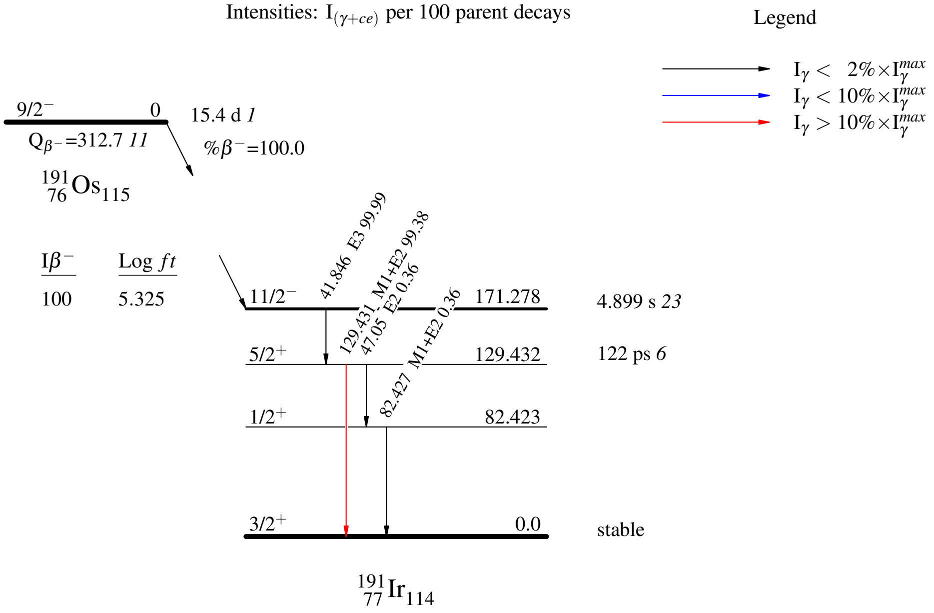
Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



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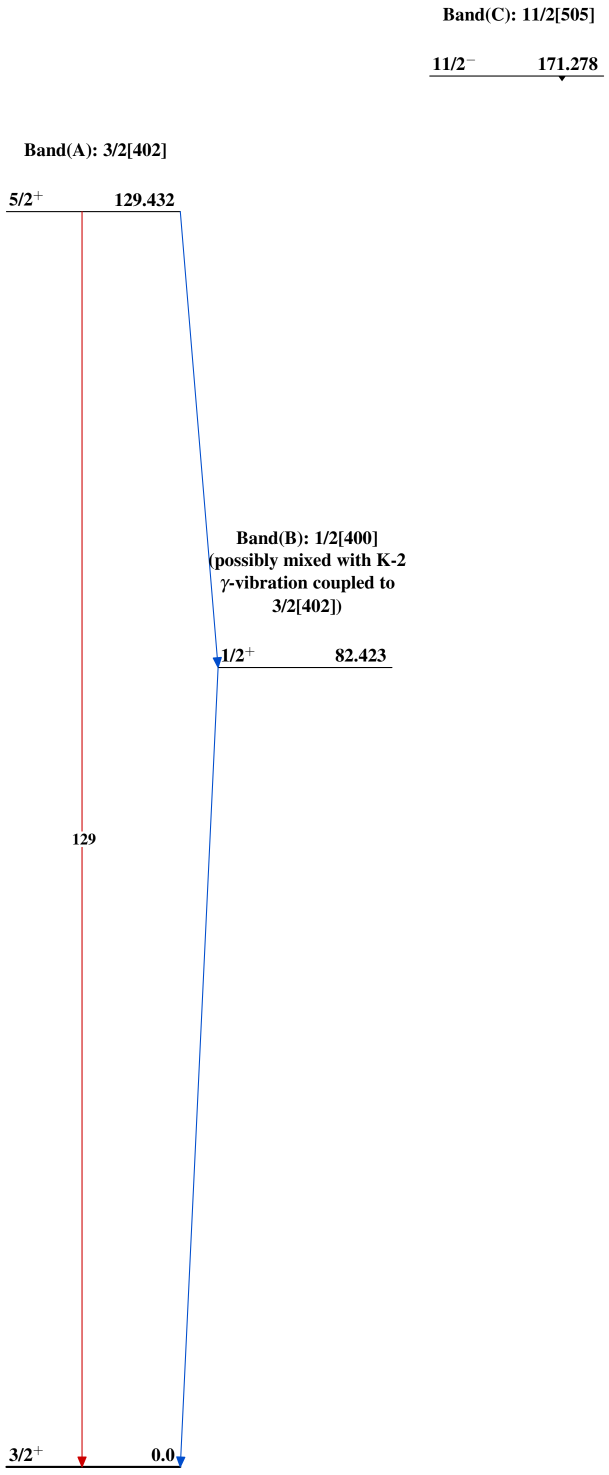

$^{191}_{77}\mathrm{Ir}_{114}$